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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,909	03/28/2001	Valentine N. Morozov	10-377 US CIP	2412
26381	7590	01/16/2004	EXAMINER	
LACASSE & ASSOCIATES, LLC 1725 DUKE STREET SUITE 650 ALEXANDRIA, VA 22314			KIANNI, KAVEH C	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 01/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/818,909	<b>Applicant(s)</b> MOROZOV ET AL.	
	<b>Examiner</b> Kevin C Kianni	<b>Art Unit</b> 2877	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 September 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 and 21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-15 and 17-19 is/are rejected.
- 7) ☐ Claim(s) 7, 16 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
     If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
     \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
     a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

- Applicant's cancellation of claim 20 in paper no. 5, is acknowledged.

#### ***Allowable Subject Matter***

1. Claims 7, 16 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 7 is allowable because the prior art, in combination with other limitations of the base claim, does not teach wherein the concave surface of the modulator array has a radius of curvature approximately equal to a focal length of the diffraction grating. Claim 16 is allowable because the prior art, in combination with other limitations of the base claim and intervening claim(s), does not teach wherein the modulator array comprises means for controlling a position of light reflection on the diffraction grating. Claim 21, is allowable because the prior art, in combination with other limitations of the base claim and intervening claim(s), does not teach wherein the concave surface of the modulator array has a radius of curvature substantially equal to a focal length of the diffraction grating.

### **Claim Rejections - 35 USC § 103**

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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3. Claims 1-6, 8-15, 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brophy et al. (US 6275623).

Regarding claim 1-6 and 8-14, Brophy teaches an equalizer(shown at least in fig. 1) comprising: a first port 16 optically coupled to an optical fiber 22 for launching a beam of light (see fig. 1, item port 16 launching light through fiber 22) comprising multiple wavelengths (see col. 1, lines 62-66); a dispersive element 40 having a surface for dispersing the beam of light into a plurality of sub-beams of light and wherein each sub-beam of light is focused in a focal plane thereof (see fig. 1, item dispersive element disperses the beam light 24 into sub-beams that are focused in focal plane/line onto element 50; see col. 5, lines 4-18); and, a modulator array 50 disposed substantially at the focal plane for receiving the plurality of sub-beams of light and for directing them back to the dispersive element 40 (see fig. 1, items 40 and 50; also col. 5, lines 16-23 and 44-52); wherein each modulator of the modulator array is disposed about the surface of the modular array to direct the plurality of sub-beams of light back to the diffraction grating 40 (see fig. 1 and 3, items modulators of 540 of the modulator 50 directs the plurality of sub-beams back to the grating 40; see col. 5, lines 34-52; also col. 6, lines 10-22). Brophy further teaches wherein the modulator array 50 comprises a mirror/reflector 52 filled with dispersed nematic or ferroelectric dispersed liquid crystal (see fig. 1 and 2, item 50 and col. 5, lines 24-52) comprises one of a liquid crystal array a polymer dispersed liquid crystal array, and a MEMS array (see col. 5, lines 24-33); wherein the first port 16 is coupled to an optical circulator 20; a reflector 38 for directing

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a beam of light transmitted from the diffraction grating 40 to a second port 18 spatially displaced from the first port 16 (shown in fig. 1, item 38); wherein the first and second ports (fig. 1, items 16 and 18) are optically coupled to input 12 and output optical waveguides/fibers 12 (see also fig. 10, items input/output optical waveguides/fibers 168, 170 and 176 optically coupled to the first and second ports of optical circulator 164; col. 9, lines 47-64).

However, Brophy does not specifically teaches wherein the above focusing of the sub-beams is implemented through a concave/convex surface shaped dispersive element; wherein the above dispersed nematic/ferroelectric material is a dispersed polymer; depressive element 40 surface is an aberration corrected concave diffraction grating; wherein the modulator array includes a concave or convex surface; wherein the above optical fiber(s) is a thermally expanded core optical fiber; and the above reflector 38 is a folding mirror. Nevertheless, Brophy states that the required wavelength dispersion could also be accomplished through other conventional diffractive or refractive optics including grating, prisms, thin film elements, or phase arrays operating under reflection or transmission (see col. 5, lines 12-15). Thus, it would have been obvious to a person of ordinary skill in the art when the invention was made to modify Brophy's gain equalizer and replace its system elements with conventionally available elements in order to include the above limitations, since these elements are just a matter of design choice in order to control attenuation of different wavelengths in WDM system (see col. 1, lines 52-61) and since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St Regis Paper

Co. v. Bemis Co., 193 USPQ; and since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claim 14, Brophy teaches an equalizer (shown at least in fig. 1) comprising: a first port 16 for launching a multiplexed beam of light (shown in fig. 1, item first port 16 launches an optical beam which is a WDM signal described in at least abstract); a diffraction grating 40 having a surface for spatially dispersing the multiplexed beam of light into a plurality of sub-beams of light and focusing each sub-beam of light onto a focal plane thereof (see fig. 1, item depressive element disperses the beam light 24 into sub-brearms that are focused in focal plane/line onto element 50; see col. 5, lines 4-18); a modulator array 50 disposed substantially at the focal plane for selectively attenuating each sub-beam of light and reflecting each sub-beam of light back to the diffraction grating 40 (see fig. 1, items 40 and 50; also col. 5, lines 16-23 and 44-52) for recombination into a single beam of light (shown in fig. 1, the output light from grating 40 is recombined into a single light); and a second port 18 for receiving the single beam of light (fig. 18, item 18). Regarding limitation concave shaped diffraction, the arguments presented in rejection of claim 1 is analogous in rejection of claim 14.

Regarding claims 15 and 17, Brophy further teaches, wherein the modulator array 50 is designed to reflect each sub-beam of light back to the diffraction grating 40

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at approximately a same position that it was diffracted from (shown in fig. 1, item 50); wherein the first and second ports correspond to first and third ports of a three port optical coupler (in fig. 1, see first and second ports (16 and 18) of the optical circulator 14).

Regarding claim 18, Brophy teaches a method of attenuation (shown at least in fig. 1) comprising the steps of launching light having multiple wavelength signals (shown in fig. 1, items wavelength beams launched from item 16); diffracting the light (item 40 grating diffractor) and focusing the diffracted light onto a modulator array 50 using a diffraction grating (shown in fig. 1, item 40; also col. 5, lines 4-24); and reflecting the light back to the diffraction grating (see col. 5, lines 16-24 and 44-52). Regarding limitation concave shaped diffraction, the arguments presented in rejection of claim 1 is analogous in rejection of claim 18.

Regarding claim 19, Brophy further teaches wherein the step of reflecting the light back to the grating 40 comprises using a modulator array 50. The arguments regarding the shape of the surface of the array modulator 50 to be concaved the arguments presented in rejection of claim 8, above, is analogous in rejection of claim 19.

***Response to Arguments and Amendment***

Applicant's argument filed on September 8, 2003 have been fully considered but they are not persuasive.

Applicant alleges (page 7, 1<sup>st</sup> parag.) that the prior art Brophy et al. US 6,275,623 does not constitute a prior art with respect to the application. The examiner responds that US 6,275,623 is indeed a prior art under U.S.C. 103(a) since the filing date of Brophy et al. (July 12, 1999) is prior to the filing date of the priority date (09/727,446: December 8, 2000) of the application.

Applicant asserts (page 7, 2<sup>nd</sup> parag.) that Brophy et al. does not teach a dispersive element having a concave surface. The examiner responds that although Brophy's grating does not have a concave surface, nevertheless, Brophy states that the required wavelength dispersion could also be accomplished through other conventional diffractive or refractive optics including grating, prisms, thin film elements, or phase arrays operating under reflection or transmission (see col. 5, lines 12-15); thus it would have been obvious to a person of ordinary skill in the art when the invention was made to modify Brophy's focusing of sub-beam into modulator 50 by replacing grating 40 with a concave-shaped grating in order to construct an equalizer that directly focuses the sub-beams onto the modulator 50, since these elements are just a matter of design choice in order to control attenuation of different wavelengths in WDM system (see col. 1, lines 52-61), and since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St Regis Paper Co. v. Bemis Co.*, 193 USPQ; and since it has been held to be within the general skill of a worker in the art



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to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

***THIS ACTION IS MADE FINAL***

This action in response to applicant's amendment made FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Cyrus Kianni whose telephone number is (703) 308-1216.

The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font, can be reached at (703) 308-4881.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

(703) 872-9306 (for formal communications intended for entry)

**or:**

Hand delivered responses should be brought to Crystal Plaza 4, 2021 South Clark Place, Arlington, VA., Fourth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

Kevin Cyrus Kianni  
Patent Examiner  
Group Art Unit 2877

  
Frank Font  
Supervisory Patent Examiner  
Group Art Unit 2877

January 2, 2004